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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/540,721

Applicant(s)

GROS ET AL.

Examiner

Elena Tsou Lightfoot

Art Unit

1792

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 41-107 is/are pending in the application.
- 4a) Of the above claim(s) 97-106 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 41-96 and 107 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/5508)
Paper No(s)/Mail Date 6/24/05, 8/29/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: _____

Election/Restrictions

1. Applicant's election of Group I, claims 41-96, and 107 in the reply filed on June 17, 2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 97-106 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Objections

2. Claims 58 and 59 are objected to because of the following informalities: TDI, MDI, HDMI or/and HDI have to be spelled out. Appropriate correction is required.
3. Claim 94 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 94 that depends on claim 42 recites "application of the pretreatment primer coat" whereas claim 42 recites limitation "without applying a pretreatment primer coat".
4. Claim 107 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 107 that depends on claim 42, recites "***further*** ...corrosion inhibitor" whereas claim 42 does not recite any inhibitors.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 41-96 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 41 and claim 42 recite in bottom 2-3 lines “the monomers, oligomers and/or polymers are selected such that a narrow distribution of medium-sized chain lengths results when the components are cross-linked”. However, neither claims nor the Applicants’ specification provides the guidance how to select suitable monomers, oligomers and/or polymers.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 41, 43, 45, 47, 49, 50, 52, 54, 56, 58, 60, 62, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, and 107 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 41 recites first that the composition comprises at least two components, then recites that the component is at least one monomer *or* oligomer (i.e. reads on only one component), which contradicts the first statement.

Claim 41 recites “at least one monofunctional monomer or/and oligomer”, which renders the claim indefinite because it is not clear whether the term “monofunctional” applies only to the monomer and also to both the monomer and the oligomer.

Regarding claims 45-46, 58-59, 60-61, 65-66, the phrase “*such as*” and/or “*e.g.*” renders the claims indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding claims 87-88, the phrase “paint-like” renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by “like”), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by “such as” and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 50-51, 58-59, 60-61, 66-72, 81-82, 89-90, 95-96 recite the broad recitation of limitation, and the claims also recite “*in particular* ...”, which is the narrower statement of the range/limitation. Claims 42, 58-59, 62, 79-80 and

107 recite the broad recitation of a limitation, and the claims also recite “*preferably* ...”, which is the narrower statement of the range/limitation.

Claims 60-61 and 107 recite “dicarboxylic acid **derivatives**” or “**derivatives** of an organic acid”, which renders the claim indefinite because the meaning of the term “derivatives” is not clear. For examining purposes the phrase was interpreted as “dicarboxylic acid” or “an organic acid”.

Claims 93-94 recite the limitation “the pretreatment primer coat” in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 94 that depends on claim 42 recites “application of the pretreatment primer coat”, which renders the claim indefinite because it contradicts claim 42 reciting limitation “*without* applying a pretreatment primer coat”.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 41-57, 59-84, 87-96, and 107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gros (DE 19925631A).

Examiner Note: instead of the Examiner will The Examiner Note: for convenience, instead of DE 19925631A in German, the Examiner will refer to US 20050186442 of the same patent family.

Gros discloses a method of applying a weldable anticorrosive coating to a metallic substrate (See Abstract) in the form of a strip (See P29) comprising applying to a metallic

substrate a mixture comprising comprising 15 to 60 wt % a polymeric organic binder (See P23), 20 to 60 wt % (See P24) a low-molecular liquid compound such as dipropylene and tripropylene glycol di(meth)acrylate, 2-acetoacetyloxy ethyl methacrylate, hexanediol diacrylate, hydroxypropyl methacrylate, hydroxyethyl methacrylate, trimethylolpropane triacrylate (See P17), 5 to 30 wt % photoinitiator (See P25), and 0.1 to 5 wt % additives (See P27) such as polysiloxanes, silanes and silicon-free oligomeric or polymeric surfactants, adhesion promoters, soluble *corrosion inhibitors*, dyes and **color pigments** (See P20), curing the coated strip by UV light sources, which have emission maxima in the spectral range from about 100 to 700 nm, at ambient temperatures, which do not lie much above room temperature, and then post curing by passing through a drying oven, which has a temperature up to about 250⁰C to increase the corrosion resistance (See P30) to provide a corrosion- and solvent-resistant slidable weldable coating which can be *deformed* together with the substrate without being damaged (See P10). The viscosity should lie in a range which allows a uniform application to form a thin layer having a thickness of about 2 to 8 μ (claimed wet and dry thickness) (See P28, 29). In any case, the layer composition and the **curing conditions** should be chosen such that a hard, firm, corrosion-resistant layer is obtained, which is, however, sufficiently tough, so that a *deformation* of the substrate, for instance of the steel sheet, is ensured without brittle cracks in the anticorrosive layer (See P31). The processing of the anticorrosive layer by the inventive method provides for a wide variation of the layer thickness within the range indicated above (See P32).

As to claimed concentration limitations, it is well settled that overlapping ranges are prima facie evidence of obviousness. Therefore, it would have been obvious to one having ordinary skill in the art to have selected the portion of Stevenson's range that corresponds to the

claimed range. Moreover, it is held that concentration limitations are obvious absent a showing of criticality. *Akzo v. E.I. du Pont de Nemours* 1 USPQ 2d 1704 (Fed. Cir. 1987).

As to claimed properties, it is the Examiner's position that a composition of Stevenson et al would provide a narrow distribution of medium-sized chain lengths when the components are cross-linked and would have claimed properties, as required by Claims 41 and 42 inherently since the process of Stevenson et al would be substantially identical to that of claimed invention.

As to claims 50-55, suitable binders include condensation resins, epoxy resins, poly(meth)acrylates, **polyurethanes**, **polyesters**, polyethers and esterification products thereof **with acrylic or methacrylic acid** (See P16).

As to claims 56-57, photoinitiators include quinones, *ketones* and the *ketals* thereof, for example benzildimethylketal, benzoin, substituted benzoin and *benzoin ethers*, *alpha.-amino ketones*; furthermore polynuclear heterocyclic compounds such as acridines, phenazines and the substitution products thereof as well as substituted *phosphine oxides*, for instance bisacyl phosphine oxides (See P18).

As to claims 58-59, the curable coating composition includes epoxidized binders (See P16) and **hydroxypropyl methacrylate** and **hydroxyethyl methacrylate** (See P17). Obviously, **hydroxypropyl methacrylate** and **hydroxyethyl methacrylate** would react with epoxy groups of the binder during thermal post cure*. Thus, **hydroxypropyl methacrylate** and **hydroxyethyl methacrylate** read on claimed curing agent.

As to claim 62, another important component are inorganic pigments, in particular anticorrosive or antirust pigments, for instance oxides, phosphides or phosphates of iron or aluminum, and other conductive pigments, for instance graphite-mica pigments (See P21).

As to claims 71-72, the viscosity can be adjusted by choosing the kind and quantity above all of the binder and of the polymerizable compound. In general, it lies in the range from 1000 to 10000 mPas (See P28).

As to claims 73-76, coating can be effected by spraying, by means of slot nozzles or by means of rollers (See P29).

As to claims 77-78, the metallic substrate to be coated preferably is a strip or sheet which mostly consists of steel (See P29).

As to claims 79-80, the inventive coating mixture *preferably* is free of inert volatile solvents, in particular organic solvents or water (See P14). Obviously, solvent may be used in nonpreferred embodiments as in prior art. If used, it is dried before applying the coating (See P7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant drying temperature parameters (including those of claimed invention) in Gros depending on particular application.

As to claims 87-88, the layer adheres to the substrate firmly and durably; it can be *overpainted* as usual, for instance by cationic dip-coating, and has a smooth, slidable surface (See P32).

As to claims 91-92, in the main field of application of the inventive method, the production and processing of body sheets for the automotive industry, the inventive coating of the sheets (coils) is advantageously effected at the sheet manufacturer after the pre-treatment. The sheets are then protected against corrosion ("coil-coated steel") and in this stage can be transported to the finisher, in general to the car manufacturer, and be stored. They are *deformed as desired* and subjected to a usual dip-coating as *priming*. To this prime coat, a **finishing paint**

will then be applied at a later date. In general, the prime coat cannot reach all parts of the deformed steel sheet. Due to the inventive coating, the surface still remains protected against corrosion despite deforming and welding,. (See P33).

As to claims 93-94, the mixture was applied to a **degreased** and dried sheet of electrolytically zinc-coated and chromitized steel (See P36).

As to claims 95-96, although Gros does not teach carrying a metal strip on a conveyor belt, it is the Examiner's position that the limitation would be obvious to one of ordinary skill in the art.

11. Claims 58-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gros '631, as applied above, and further in view of Dichter et al (US 4421569)*.

Gros does not explicitly disclose chemical reactions occurring during post cure.

Dichter et al teaches that the hydroxyl functional group of the monomers such as ethyl methacrylate can react with the epoxy or hydroxyl groups of the epoxy ester to provide an additional bonding between the active polymer chains formed on the metal surface and polymers. The acrylics and methacrylic monomers help to provide a uniform flexible film with good corrosion protection properties. (See column 4, lines 28-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used **hydroxypropyl methacrylate** and **hydroxyethyl methacrylate** as the low-molecular liquid compound together with epoxidized binders in Gros the expectation of providing the desired uniform flexible film with good corrosion protection properties, as taught by Dichter et al.

12. Claims 41-57, 59-84, 87-96, and 107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shustack (US 5,128,387).

Shustack describes process for coating a metallic surface of a metallic substrate (See column 2, lines 61-69) comprising applying to the metallic surface (i.e. without applying a pretreatment coat, as required by Claim 42) a radiation curable composition containing three essential ingredients (See column 4, lines 4-69): 15-75 wt % of a bulky monomer component such as *isobornyl acrylate or/and isobornyl methacrylate* (claimed monofunctional monomer) (See column 5, lines 21-34); 10-80 wt % an oligomeric component such as a *mixture* of acrylated or methacrylated oligomer (claimed oligomer) (See column 6, lines 1-22) or , 0.3-10 wt % of an organic adhesion promoter (See column 2, lines 24-48) for bonding the cured coating to the metal surface (i.e. claimed organic corrosion inhibitor) (See column 4, lines 27-34), and 0.3-10 wt % of a photoinitiator (See column 9, lines 22-25); and curing by UV radiation (See column 12, lines 32-36). If the coating is cured using an electron beam process, a photoinitiator is not needed; for UV and other types of radiation curing, the photoinitiator is usually an essential component (See column 3, lines 60-64). The coated metal substrate can be formed or stretched, and the cured coating will still maintain its bond to a metal surface (See column 3, lines 3-6), i.e. the composition is anticorrosive composition as claimed.

As to claimed concentration limitations, it is well settled that overlapping ranges are prima facie evidence of obviousness. Therefore, it would have been obvious to one having ordinary skill in the art to have selected the portion of Shustack's range that corresponds to the claimed range. Moreover, it is held that concentration limitations are obvious absent a showing of criticality. *Akzo v. E.I. du Pont de Nemours* 1 USPQ 2d 1704 (Fed. Cir. 1987).

As to claimed thickness, one of ordinary skill in the art would easily recognize that properties of coating layer including anti-corrosion properties, flexibility, wear resistance depend

on the thickness of the coating. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant thickness parameters (including those of claimed invention) in Shustack through routine experimentation in the absence of showing of criticality.

As to claimed properties, it is the Examiner's position that a composition of Shustack would provide a narrow distribution of medium-sized chain lengths when the components are cross-linked and would have claimed properties, as required by Claims 41 and 42 inherently since the process of Shustack would be substantially identical to that of claimed invention.

As to claims 43-48, 50-51, the oligomer component also comprises 5-50 wt % of a polyester acrylate or methacrylate oligomer such has acrylated or methacrylated **polyester oligomer (claimed polymer)**, which optimizes adhesion and *flexibility* of the composition (See column 8, lines 12-42) or **polyurethane polyacrylate oligomers (claimed polymer)** (See column 7, lines 21-22).

As to claims 52-53, the adhesion promoters include acid modified acrylic resins (claimed coupling polymer) (See column 9, lines 10-11).

As to claims 56-57, suitable photoinitiators include, for example, hydroxy cyclohexyl phenyl ketone, *benzophenone*, hydroxy methyl phenyl propanone, dimethoxy phenyl acetophenone, diethoxy acetophenone, and the like (See column 9, lines 23-30).

As to claims 60-61 and 107, an acidic adhesion promoter includes dibasic organic acids (See column 9, lines 8-17).

As to claim 62, "further corrosion inhibitor" limitation is *optional* and, thus, is not addressed here.

As to claims 65-68, a polyethylene wax additive may be optionally added to a composition to increase slip and abrasion resistance (See column 9, lines 31-34). Another optional additive is a fluorinated hydrocarbon such as polytetrafluoroethylene (Teflon). This additive increases the surface slip of the coating, in addition to improving abrasion resistance. (See column 9, lines 60-68).

As to claims 69-70, Pigments and dyes may be included to achieve desired visual effects (claimed colored pigment) (See column 4, lines 1-3).

As to claims 71-72, Shustack discloses that the liquid coating formulation must have a *viscosity* permitting ease of application, and it must have good wetting characteristics for its metal substrate (See column 16, lines 38-40). It is well known in the art that for different techniques different viscosities are required. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant viscosity parameters (including those of claimed invention) in Shustack depending on particular applying technique used.

As to claims 73-74, the liquid coating formulation is applied at room temperature (See column 14, lines 33-35).

As to claims 75-76, Shustack is silent about application technique. Therefore, it would have been obvious to use any conventional technique including claimed ones.

As to claims 77-78, the compositions can be used to form coatings on surfaces of articles made of steel and aluminum and its alloys (See column 2, lines 61-66).

As to claims 79-80, solvent limitation is *optional* and, thus, is not addressed here.

As to claims 87-88, the coating may be a single pigmented layer or the pigmented layer may be overcoated with a clear layer. Generally, overcoating with a clear layer is the preferred approach, using a single pass through curing radiation equipment for curing and hardening both layers at the same time. Alternatively, though less preferably, the pigmented layer may be cured before applying the overcoat. See column 3, lines 25-33.

As to claims 91-92, the composition is useful in forming coatings on metal surfaces that would remain bonded, after curing, to the metal surfaces even **when the metal articles were worked**. Thus in preferred embodiments of the invention the coated metal article can be **formed** or stretched, and the cured coating will still maintain its bond to a metal surface. See column 3, lines 1-6.

As to claims 93-94, Shustack teaches that in the production of e.g. beverage cans, such as aluminum beer cans, a can cup is formed from a sheet of aluminum of desired thickness, then washed with alkaline and acid baths and dried before coating (See column 3, lines 6-16). The can cup can be washed by passing through a series of alkaline and acid baths. Between each bath the can cup is rinsed with fresh water, and the final rinse is with deionized water. See column 13, lines 30-37.

Shustack fails to teach that a pretreatment primer is applied to cleaned surface. However, it is a well-known principle to reapply a coating composition to achieve a desired thickness of a final coating depending on intended use of the final coated product.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have reapplied a coating dispersion in Shustack, according to well-known principle, with the expectation of providing the desired thickness of a final coating.

As to claims 95-96, Shustack teaches that the initial step in making an aluminum can requires a series of die punches from aluminum flat stock wound off a supply coil (See column 13, lines 29-32).

13. Claims 41-66, 69-92, 95-96, and 107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevenson et al (US 6087417).

Stevenson et al discloses a process comprising applying to a metal substrate such as galvanized steel or *aluminum* in the form of sheets, or *coils* (See column 10, lines 36-44) with solvent-free curable coating composition which include (A) 65-95 wt % (See column 9, lines 33-34) of a reaction product of epoxy resin, acid, and tertiary amine (claimed radically curable polymer); (B) 5-35 wt % (See column 9, lines 35-36) of reactive diluent, (C) curing agent (See Abstract) and a *photoinitiator* (See column 8, lines 37-38); and curing the coated metal substrate using a two stage process--(i) an *initial radiation* such as UV radiation (See column 10, lines 60-61) causing any unsaturated groups in the coating composition polymerize, i.e., the acrylate groups contained in the quaternary salts (See column 11, lines 5-8), any *unsaturated carboxylic acids* (claimed first organic corrosion inhibitor and coupling polymer) and any unsaturated diluents, to form a polymerized coated substrate (See column 2, lines 42-49); and (ii) heating the resulting UV polymerized coated substrate at about 400°F (204°C) or above to decompose the quaternary ammonium salt groups (claimed first organic corrosion inhibitor) and to provide the *desired adhesion* of the coating to the substrate (See column 11, lines 8-12). The reactive diluent (B) includes acrylated and methacrylated compounds of molecular weight of 250 to 1000, i.e. claimed radically curable monofunctional acrylate and methacrylate monomers and/or oligomers (See column 7, lines 42-55). The method is especially useful for making can ends and

can bodies where a high degree of ***flexibility and corrosion resistance*** (claimed anticorrosive composition) is needed (See column 11, lines 27-30). The coating that is more **flexible** while remaining impervious and will undergo further **post cure fabrication** by employing at least about 50 wt. % and preferably at least about 90% polyoxyalkylene glycol monoacrylate ester as the reactive diluent the cured coating is, a coating which is generally desired (See column 7, lines 58-65).

As to claimed coating thickness, Stevenson et al teaches that the method for forming cured coated substrates is useful for the interior and exterior coating of metal containers that will come in contact with food or beverages. The method is especially useful for making can ends and can bodies where a **high degree of flexibility and corrosion resistance** is needed (See column 11, lines 25-30). Additionally, this invention can be used as a **side seam** coating for the interior of food and/or beverage cans. Side seam coating are generally applied as **thick** films and require blister resistant coatings (See column 11, lines 30-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant thickness parameters (including those of claimed invention) in Stevenson et al through routine experimentation depending on particular application in the absence of showing of criticality.

As to claimed concentration limitations, it is well settled that overlapping ranges are prima facie evidence of obviousness. Therefore, it would have been obvious to one having ordinary skill in the art to have selected the portion of Stevenson's range that corresponds to the claimed range. Moreover, it is held that concentration limitations are obvious absent a showing of criticality. *Akzo v. E.I. du Pont de Nemours* 1 USPQ 2d 1704 (Fed. Cir. 1987).

As to claimed properties, it is the Examiner's position that a composition of Stevenson et al would provide a narrow distribution of medium-sized chain lengths when the components are cross-linked and would have claimed properties, as required by Claims 41 and 42 inherently since the process of Stevenson et al would be substantially identical to that of claimed invention.

As to claims 43-48, 50-51, the reactive diluent comprises a *polyester* acrylate or methacrylate (See column 7, lines 48-49).

As to claim 49, ethylenically unsaturated reactive diluents are the mono and **diesters** of polyoxyalkylene ethers such as polyethers prepared from **ethylene** and *propylene* oxide. Suitable diluents include polyalkylene glycol mono-(meth)acrylates, polyalkylene glycol di(meth)acrylates (i.e. include claimed diethylene glycol diacrylate or claimed dipropylene glycol diacrylate) (See column 7, lines 42-47).

As to claims 50-51, (meth)acrylic mono- and diesters of a number of polyether compounds are available commercially and can be used to good effect to *modify the crosslink density* and glass transition temperature of the cured epoxy-vinyl polymer coated substrates (See column 7, lines 36-40). Where the coating is to be applied to a metal substrate which will undergo further post cure fabrication, a **coating which is more flexible while remaining impervious** is generally desired (See column 7, lines 57-62). This can be achieved by employing versions of the present coating compositions which include at least about 50 wt. % polyoxyalkylene glycol monoacrylate ester as the reactive diluent (claimed additional flexibilizing resin) (See column 7, lines 62-65).

As to claims 56-57, *any of the commonly used photoinitiators may be used*. Among these the combination of *benzophenone* and a tertiary amine are examples of suitable initiators for use

with the water-based coatings described herein. Initiator levels may vary from 1 to 5 wt. % depending on the oxygen content of the atmosphere over the coating, the coating viscosity at the point of cure, the line speed, and the number and intensity of the ultraviolet lights employed. (See column 8, lines 37-48).

As to claims 58-59, the curable coating composition includes curing agents, such as **aminoplast** resins (claimed melamine resin), phenoplast resins, or mixtures thereof (claimed hardener for a chemical postcure), depending on the amount of saturated acid or hydroxyl bearing diluent employed (See column 8, lines 24-25).

As to claim 62, "further corrosion inhibitor" limitation is *optional* and, thus, is not addressed here.

As to claims 65-66, surfactants (claimed wetting agent) and other coating *additives*, as well known in the art can also be added to the coating composition (See column 8, lines 66+).

As to claims 69-70, pigments, dyes or other coloring agents may be included to achieve desired visual effects (claimed colored pigment) (See column 12, lines 7-10).

As to claims 71-72, aqueous versions of the present curable coating composition typically include at least about 25 wt. % of a coating solids component and about 50 to about 75 wt. % water. Preferably, the aqueous coating compositions have a coating solids content of about 25 to about 40 wt. % and a #4 Ford cup viscosity (at 25.degree. C.) of about 15 to about 75 seconds (See column 9, lines 7-12). It is well known in the art that for different techniques different viscosities are required. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant

viscosity parameters (including those of claimed invention) in Stevenson et al depending on particular applying technique used.

As to claims 73-76, the liquid coating formulation is applied by bar coater or roller coater at room temperature (See column 16, lines 10-12). The solvent-free composition can be applied to the substrate as liquid (at room temperature) (See column 8, lines 11-15) by a variety of techniques and equipment, including: heated multi-**roller** application equipment; slotted nozzles or blades; **spray** guns, or other similar equipment (See column 2, lines 32-35; column 10, lines 7-13).

As to claims 77-78, the compositions can be used to form coatings on surfaces of articles made of steel and aluminum and its alloys (See column 10, lines 43-44).

As to claims 79-80, if desired, the coated substrate can be dried prior to polymerization and heating. During the optional drying step, the coated substrate is typically briefly pre-baked to remove any water or solvent using either a infrared drying unit, a conventional oven, or forced hot air. (See column 10, lines 45-48). Obviously, drying temperature would depend on particular composition, thickness, etc. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant drying temperature parameters (including those of claimed invention) in Stevenson et al depending on particular application.

As to claims 91-92, After forming the cured coated substrate, the substrate is cooled to a temperature where it may be further handled and **processed as desired without damaging** the cured coating layer (See column 11, lines 15-24).

As to claims 95-96, Stevenson et al teaches carrying a metal strip on a conveyor belt (See column 16, lines 15-19).

14. Claims 67-68, 87-88, and 93-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevenson et al '417 in view of Shustack '387.

As to claims 67-68, Stevenson et al discloses that surfactants (claimed wetting agent) and other coating *additives*, as well known in the art can also be added to the coating composition (See column 8, lines 66+). Stevenson et al fails to teach that the additives include a lubricant.

Shustack teaches that a polyethylene wax additive or a fluorinated hydrocarbon such as polytetrafluoroethylene (Teflon) may be optionally added to a composition to increase slip and abrasion resistance (See column 9, lines 31-34, column 9, lines 60-68).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a polyethylene wax and/or Teflon as additives in Stevenson et al with the expectation of providing the desired increased slip and abrasion resistance, as taught by Shustack.

As to claims 87-88, Shustack teaches that the coating may be a single pigmented layer or the pigmented layer may be overcoated with a clear layer. Generally, overcoating with a clear layer is the preferred approach, using a single pass through curing radiation equipment for curing and hardening both layers at the same time. Alternatively, though less preferably, the pigmented layer may be cured before applying the overcoat. See column 3, lines 25-33.

As to claims 93-94, Stevenson et al teaches that the substrate may optionally be subjected to any desired preparation or treatment steps before application of the coating composition. Examples of such treatments include cleaning, corona treatments, flame treatment, and

application of *primers*, adhesives or other layers (See column 12, lines 14-17). Stevenson et al fails to teach cleaning and/or pickling the metallic substrate before application of the primer. However, Shustack teaches that in the production of e.g. beverage cans, such as aluminum beer cans, a can cup is formed from a sheet of aluminum of desired thickness, then washed with alkaline and acid baths and dried before coating (See column 3, lines 6-16). The can cup can be washed by passing through a series of *alkaline and acid baths*. Between each bath the can cup is rinsed with fresh water, and the final rinse is with deionized water. See column 13, lines 30-37.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have pickled and rinsed the metallic substrate before application of the primer in Stevenson et al.

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2676166 to Webers is cited here to show the reaction of epoxy-containing materials with tertiary amines to form quaternary ammonium groups (See column 2, lines 1-16).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy Lightfoot whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Friday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Art Unit 1792

July 30, 2009

/Elena Tsoy Lightfoot/